

Application No.: 10/528,690
Amendment under 37 CFR 1.111
Reply to Office Action dated June 25, 2008
September 25, 2008

AMENDMENTS TO THE CLAIMS

Please substitute the following claims for the pending claims with the same numbers respectively:

Claim 1 (Currently amended): A device for bonding objects to be bonded each having a metal bonding portion on a surface of a substrate, comprising:

cleaning means for exposing the surfaces of the metal bonding portions to a plasma having an energy enough to etch the surfaces of the metal bonding portions at a depth of 1.6 nm or more over the entire surfaces of the metal bonding portions under a reduced pressure;~~and,~~

wherein said cleaning means comprises an argon plasma irradiating means; and

bonding means for bonding the metal bonding portions of [[said]] the objects taken out of said cleaning means to each other in an atmospheric air,

wherein said bonding means has a heating mechanism and bonds the metal bonding portions to each other at a temperature of 180°C or lower,

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wherein said bonding means includes means for making a dispersion of a gap between the metal bonding portions at the time of bonding to be 4 μ m or less at a maximum,

wherein said bonding means includes means for making a surface roughness of at least one metal bonding portion after bonding to be 10 nm or less,

wherein said bonding means includes means for bonding the metal bonding portions to each other at a bonding load of 300 MPa or less,

wherein said bonding means includes means capable of adjusting a parallelism in a bonding area between substrates at the time of bonding the metal bonding portions to each other at 4 μ m or less; and

wherein the surfaces of the metal bonding portions to be bonded to each other are both formed from gold;

a surface roughness of at least one metal bonding portion before bonding is made to be 100 nm or less;

a surface hardness of the metal bonding portions is set at 100 or less in Vickers hardness Hv;

at least one of the metal bonding portions is formed by a plurality of bumps; and

a dispersion of bump height is 4 μ m or less.

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Claims 2-26 (Cancelled):